

# TT-46

## ADVANCED WIRETAP DETECTOR INSTRUCTION MANUAL

### TT-46 GENERAL INFORMATION

The TT-46 can detect both series and parallel wiretaps that are attached directly to the on premises telephone line. It can also be used to detect hookswitch bypasses that may be installed inside the telephone.

It can detect series taps of 10 ohms or more and parallel taps with a resistance of 65 megohms or less. In a four wire cable (used with most single and two line phone systems) it can check all six possible wire combinations for taps or other tampering. Listed below are definitions for several terms used in this manual.

**BUG** – Clandestine listening device.

**HOOKSWITCH BYPASS** – Modification to the telephone instrument so that the carbon microphone (transmitter) or dynamic earphone (receiver) will pick up room sounds and pass them down the phone line to a listening post even with the phone hung up. Turns the telephone into a bug.

**PARALLEL TAP** – Connected across both wires of a pair. Usually used to activate a tape recorder. DC resistance ranges from 10 to 35 megohms. May also be a radio transmitter, in which case, a separate battery would be required for powering the transmitter.

**SERIES TAP** – Usually a radio transmitter. Obtains power from the telephone line to which it is attached. It is installed in series (inline with one wire). Generally has a DC resistance of 70 to 300 ohms. And although rare it can also be used to activate a tape recorder.

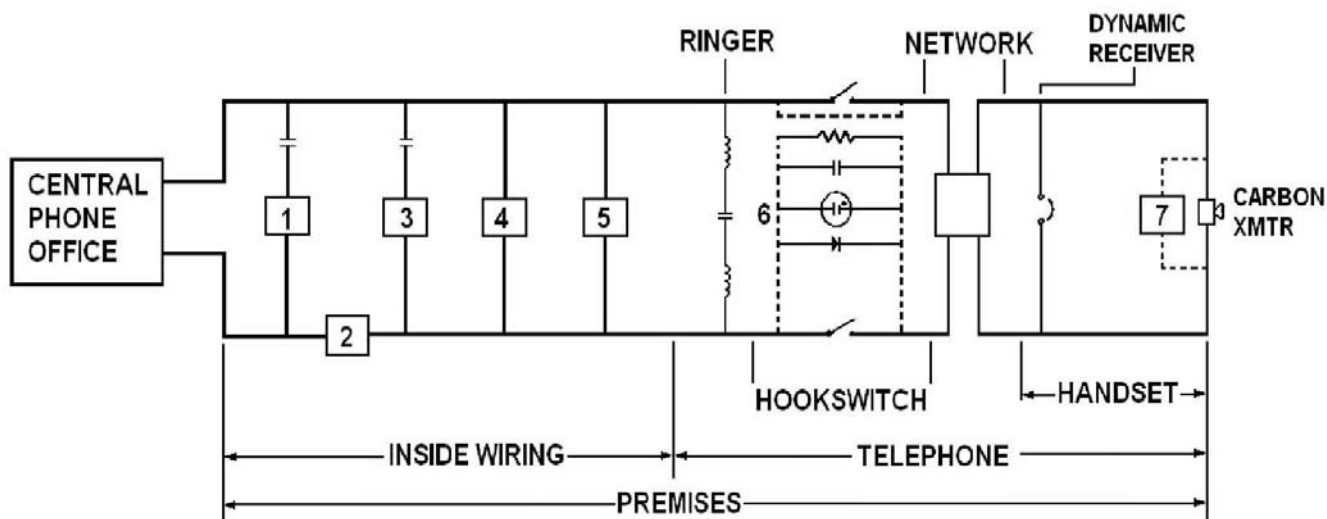
**WIRETAP** – Clandestine interception of a telephone conversation. Operates when the telephone is in use.

We recommend that you perform the tests in the order given in the manual. While the tests can be done in any order, the manual lays out the most efficient procedure.

### USING THE TT-46

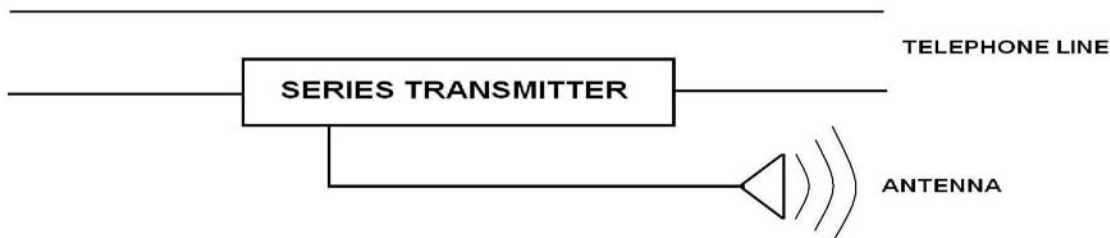
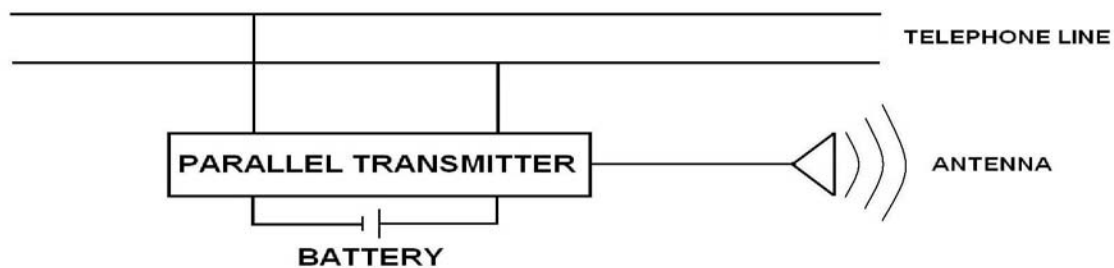
Install a battery in the TT-46 (alkaline only) if one has not already been installed. To access the battery compartment, insert a small flat blade screwdriver in the screwdriver slot at the bottom of the face panel and pry up. The front panel will pop off. After installing the battery, replace the front panel, pressing on its edges until it snaps into place.

The telephone cable generally used as inside wiring for single and two line service has four wires arranged in two pairs: red/green and black/yellow. These four wires give six possible pair combinations that should be checked (r/g, r/y, r/b, g/y, g/b and y/b). Through the use of the various switches on the TT-46, you will be able to test all six combinations for both series and parallel taps and other forms of tampering.



- |                                 |                         |
|---------------------------------|-------------------------|
| 1. DIRECT HARDWIRE TAP          | 5. INFINITY TRANSMITTER |
| 2. SERIES RF TAP                | 6. HOOKSWITCH BYPASS    |
| 3. PARALLEL RF TAP WITH BATTERY | 7. DROP IN TRANSMITTER  |
| 4. PARALLEL RECORDER ACTIVATOR  |                         |

## COMMON ON PREMISES TELEPHONE EAVESDROPPING ATTACKS



The following is a description of the functions of the switches and indicators on the TT-46. Please refer to your unit for their locations.

**MODE:** Selects the type of test to be performed from the four below.

**PARALLEL:** Checks for taps and bugs wired across the pair. Can detect resistances of 65 megohms or less.

**SERIES:** Checks for taps and bugs wired inline. Detects resistances of 10 ohms or more.

**VERIFY:** Lets you listen to a wire pair for the presence of room audio.

**DRIVER:** Applies a voltage to a wire pair to turn on a voltage operated device such as a FET microphone.

**TEST 1/TEST 2:** Reverses the connection to the pair under test. Useful for detecting certain polarity sensitive devices.

**PAIR:** Selects one of six combinations for testing. All tests should be applied to all pairs.

**VOLUME:** Combination switch/volume control for the audio amplifier used in the Verify and Driver tests.

**PARALLEL LED:** Glows red if the Parallel test detects 65 megohms or less. Glows green if the test is OK.

**SERIES LED:** Glows red if the Series test detects 10 ohms or more. Glows green if the test is OK.

**PUSH TO TEST:** Use to apply the test to a wire pair in the Parallel, Series and Driver tests. It has no function in the Verify test mode.

Connect the test cable by plugging it into the 5-pin jack located at the hinge end of the unit. Be sure the plug is completely seated in the jack.

### **PARALLEL TAP TEST**

1. Disconnect the inside wiring at the protector block or Telephone Network Interface (TNI). The protector or TNI can be located inside or outside the building and is the point of separation between the inside wiring and the phone company line. Make a note of the wire colors and connections so you can reconnect them properly when you are finished. With the TNI simply unplug the modular plug to disconnect the inside wiring from the phone line.
2. Disconnect all telephones, answering machines, etc.
3. Set the TT-46 switches as follows: Pair to "R-G" Volume to "OFF" Mode to "*parallel*" and Test to "*Test 1*". Connect the unit to the inside wiring at any convenient point. If your building does not use modular jacks, it will be necessary to connect the TT-46 using the coupler and cord with alligator clips. Connect color to color, i.e., red to red, etc.
4. Push and hold down the *PUSH TO TEST* (PTT) button. The *Parallel LED* should glow green. While continuing to hold down the *PTT* button, rotate the *Pair* switch through all six positions. Then release the *PTT* switch.

If the *Parallel LED* flashed red briefly, some additional tests are necessary. Here's why - 100 feet of inside wiring has about .002 uF of stray capacitance between any two wires. This stray capacitance could cause the LED to briefly flash red.

To check for the presence of a capacitively coupled parallel wiretap, press and hold down the *PTT* switch again. Rotate the *Pair* switch through all six positions from R-G to Y-B and back again four times without releasing the *PTT* switch. If any of the pair combinations still flash red, it is an indication of a capacitively coupled tap.

Using this test method, the stray wiring capacitance is charged by the test set and that charge will remain for a period of time, but a capacitively coupled tap will discharge between rotations of the pair switch, causing the LED to flash red.

5. Do the same tests as #4 above with the *Test* switch in the *Test 2* position.
6. Leave the TT-46 and inside wiring set up for the *Parallel* test and perform the *Verify* test.

### **WIRE PAIR VERIFY TEST**

In this test mode you will check the inside wiring for room audio that could be present if a microphone is attached to one of the wire pairs. Technically, this would not be a wiretap, but a bug. However, the result is the same – your confidential information is passed on to a listening post.

1. Set the Mode switch to "*Verify*" the *Pair* switch to "*R-G*" and turn on the Volume to about midrange.
2. Move the *Pair* switch through all six positions while listening to the audio output. It's a good idea to play a radio or TV in the target room while doing a sweep. This gives you a known sound source, it will also turn on sound activated bugs. If you hear room audio or a feedback squeal from the test set, it is an indication that a microphone is attached to one of the wire pairs.
3. Leave the TT-46 connected and perform the *Driver* test.

### **WIRE PAIR DRIVER TEST**

In this test you will apply voltage to each pair to turn on voltage operated devices such as FET (Field Effect Transistor) microphones. Again, these are not wiretaps, but bugs.

1. Turn the Mode switch to "*Driver*" the *Pair* switch to "*R-G*" Test switch to "*Test 1*" and the Volume to midrange.
2. Press the *PTT* switch and listen for room audio or feedback squeal. Release the *PTT* switch and move the *Pair* switch to the next position.
3. Do step 2 for each position of the *Pair* switch. When all six pairs have been checked, return the *Pair* switch to the *R-G* position.

4. Set the *Test* switch to *Test 2* and repeat steps 2 and 3.
5. Disconnect the TT-46 and return the inside wiring to its normal condition or go on to the Series test described next. If you got an indication of a parallel tap or bug, go to the pages on locating wiretaps.

### **SERIES TAP TEST**

In this test, you will be checking each wire pair for a series (in line) tap. Follow the steps listed below.

1. At the protector block or TNI make sure the inside wires are disconnected from the phone line as discussed earlier and short all four lines together. This can be done by connecting all four wires to the same binding post and tightening the nut or screw.
2. Set the TT-46 switches as follows: Mode to “*Series*” Test to “*Test 1*” Pair to “*R-G*” Volume to “*Off*”. Connect the TT-46 in turn to each inside wiring connection point. It is important to run the test at each jack so that each leg or branch is tested. This was not necessary in the *Parallel* test since all branches or legs are automatically tested in parallel.
3. At each connection point, push and release the *PTT* switch for each position on the Pair switch. Before leaving one connection point for the next, repeat the tests with the *Test* switch in the *Test 2* position.
4. For each pair, the Series LED should glow green when the PTT switch is pressed. If it is red for any of the tests, this means the loop resistance is over 10 ohms and is an indication of a series tap.
5. Return the inside wiring at the protector block or TNI to its normal condition (reconnect each wire to its proper place). Reconnect your telephones, answering machines, etc. to return your system to normal.

### **HOOKSWITCH BYPASS TEST VERIFY MODE**

This test lets you check your telephone for hookswitch bypass tampering. In this test, you will use the dual modular coupler. Phones without modular plugs can be tested using the in-line coupler and modular cord with alligator clips.

1. On the TT-46 set the switches as follows: Mode to “*Verify*” Test to “*Test 1*” Pair to “*R-G*” and Volume to midrange.
2. Unplug the telephone to be tested from its wall jack and plug the dual coupler into the jack in its place. Then plug the phone into one jack of the dual coupler and the TT-46 into the other jack.
3. Lightly tap the phone housing with a pen or pencil. If you hear the tapping in the TT-46 speaker, it is an indication that the phone is capable of transmitting room audio down the line when the phone is hung up. You may also hear a feedback squeal, depending on the sensitivity of the hookswitch bypass.
4. Rotate the *Pair* switch through all six positions while repeating step 3.

5. Turn off the TT-46, remove the dual coupler and reconnect the phone to its wall jack. If you have other phones, answering machines, etc., they should be checked in the same manner as outlined above. If your telephone does not have a modular plug, it can be tested in the same manner as above, but you will have to open the connector block or jack where the phone is connected and use the modular coupler and cord with alligator clips to make your connections. Be sure to connect red to red, etc.

### **HOOKSWITCH BYPASS TEST DRIVER MODE**

This test lets you check your phones for hookswitch bypass tampering without having the phone connected to an active line.

1. On the TT-46 set the switches as follows: Mode to "*Driver*" Test to "*Test 1*" Pair to "*R-G*" and the Volume to midrange.
2. Plug the phone into one jack of the dual coupler and the TT-46 into the other dual coupler jack.
3. Press the *PTT* switch while lightly tapping the phone housing with a pen or pencil. If you hear the tapping in the TT-46 speaker, it is an indication that the phone is "hot on hook". Release the *PTT* switch.
4. Rotate the Pair switch through all six positions while repeating step 3.
5. Place the test switch in the "*Test 2*" position and repeat steps 3 and 4.

### **LOCATING WIRETAPS AND WHAT TO DO IF YOU FIND ONE**

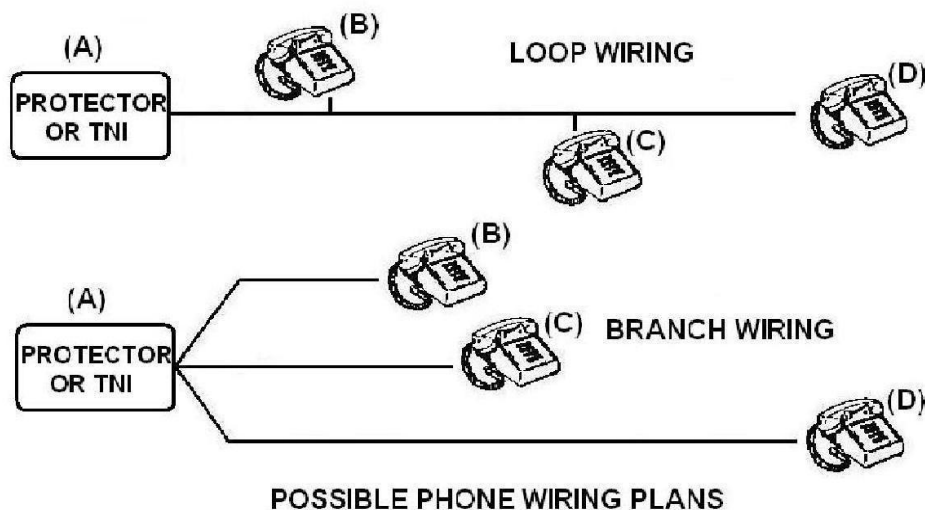
All of the wiretaps can be located by close physical inspection of the inside wiring. Remember, if someone installed it, you'll be able to find it.

Note that series taps can be made very small. A favorite way to disguise one is to wrap it with tape so it looks like a wire splice or connection.

There are two basic ways phone systems are wired. In the loop method, each phone is connected at different points to the same wire run. In the branch method, a separate wire pair is run to each phone location from the TNI.

When performing the Parallel test, all the wiring is tested at one time, regardless of the wiring method used.

In the Series test, if the test was made at point D in the Loop Wiring method, the entire loop would be checked with one test. But, if you only checked at point C, the wiring from C to D would not be tested. So, it is important for you to know the wiring plan before you start testing.



If you find one tap, don't stop looking – there may be others. A common technique of people planting taps is to place one that can easily be found in the hopes that you won't look for any more after finding the first one. If you find one tap, it would be a good idea to retest the inside wiring to be sure no others are present.

The hookswitch bypass can also be found by examination of the phone. The bypass will consist of one or more resistors, capacitors or diodes, usually connected to either the hookswitch assembly or network. Look for anything in the phone that doesn't "fit in" or that seems out of place. Since phones are relatively inexpensive, you may want to replace a suspicious phone with a new one.

If you find a tap, then what? Your first impulse will probably be to rip it out – but stop and think before you do that. It may be worth while to try to determine who planted it and use the tap to feed them false information.

Another reason for leaving the tap in place is so that you can get law enforcements help in prosecuting whoever placed the illegal tap. Most law enforcement departments do not have the manpower to help if you just suspect a tap, but if you have the physical evidence they should be willing to investigate. Remember, wiretapping is a Federal crime as well as a violation in most states.

### **LIMITATIONS**

While the TT-46 will detect the most common on-premises wiretaps and hookswitch bypasses, there are some it won't detect. These include drop-in transmitters, bypasses activated by high voltage and inductive taps that don't have a physical connection to the phone or line. In addition to the drop-in transmitter, other series RF (radio) transmitter taps can be installed inside the telephone however; they can all be located with the TD-53 RF detector.

Of course, the TT-46 does not detect off-premises wiretaps such as court ordered taps that are connected down line or at the central phone office.